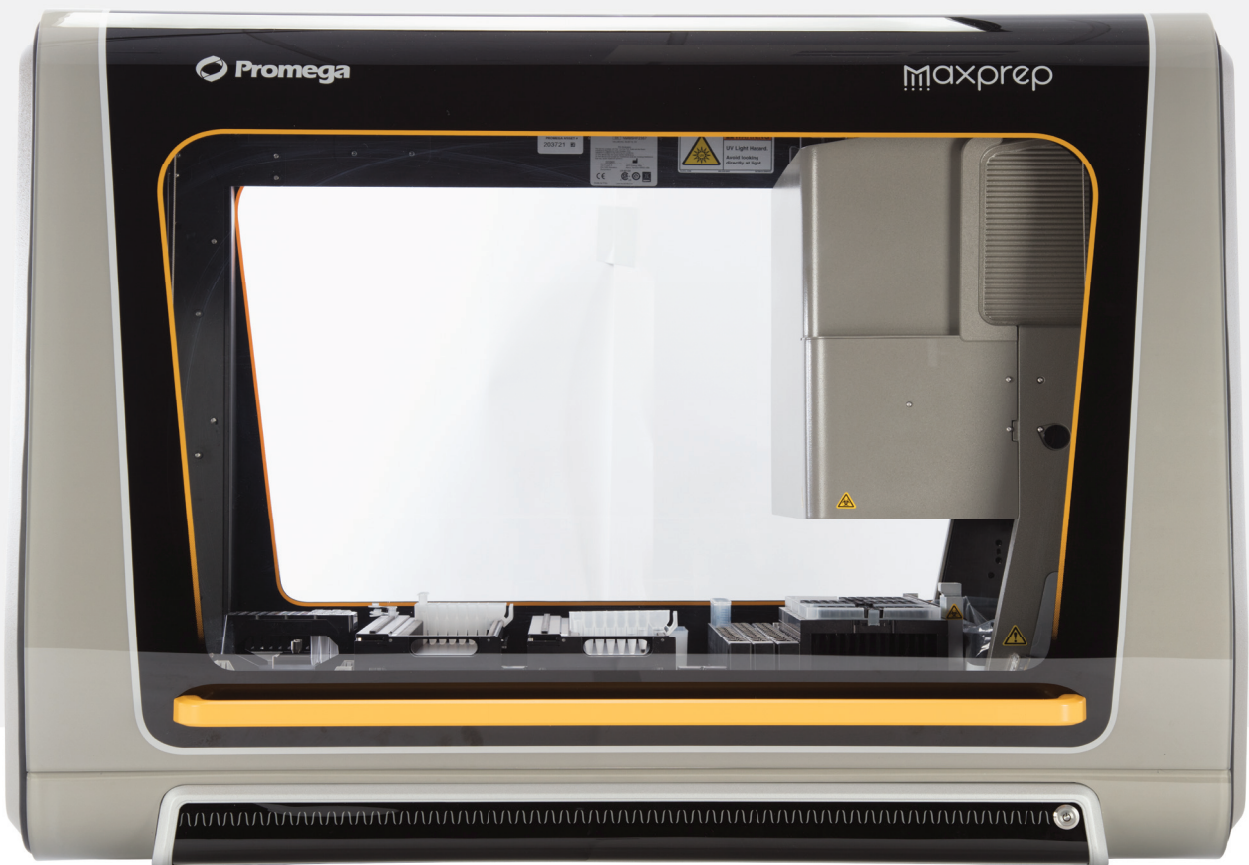


# Normalization, Sample Dilution and Sample Transfer Methods for the Maxprep<sup>®</sup> Liquid Handler Technical Manual

Instructions for Use of Products AS9100, AS9101, AS9105, AS9200, AS9201 and AS9205



# Table of Contents

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|     |   |    |
|-----|---|----|
| 1   | Description.....  | 4  |
| 2   | Before You Begin .....  | 5  |
| 2.1 | Maxprep® Normalization, Sample Dilution and Sample Transfer Methods .....                 | 5  |
| 2.2 | Materials to be Supplied by the User .....  | 5  |
| 2.3 | Selecting a Maxprep® Normalization, Sample Dilution or Sample Transfer Method .....       | 6  |
| 2.4 | Starting a Maxprep® Method .....  | 8  |
| 2.5 | Entering Run-Specific Information .....   | 9  |
| 2.6 | Instrument Setup Instructions .....   | 19 |
| 2.7 | Maxprep® Liquid Handler Normalization, Sample Dilution and Sample Transfer Protocol ..... | 27 |
| 3   | Potential Errors and Warnings .....   | 28 |
| 3.1 | Intrusion Sensor .....  | 28 |
| 3.2 | Unable to Load Tips .....   | 30 |
| 3.3 | Insufficient Tips .....   | 30 |
| 3.4 | Insufficient Sample .....   | 30 |
| 3.5 | Insufficient Liquid .....   | 31 |
| 3.6 | Hardware Crash .....  | 31 |
| 3.7 | Aborted Run .....   | 32 |
| 3.8 | Instrument Connection Errors .....  | 33 |

|     |   |    |
|-----|---|----|
| 4   | Variant Method Variables .....          | 34 |
| 4.1 | Normalization Variant Variables .....   | 34 |
| 4.2 | Sample Dilution Variant Variables ..... | 37 |
| 4.3 | Sample Transfer Variant Variables ..... | 39 |
| 5   | Troubleshooting.....                    | 40 |
| 6   | Related Products .....                  | 41 |
| 7   | Summary of Changes.....                 | 42 |

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Visit the website to verify that you are using the most current version of this Technical Manual.

Email Promega Technical Services if you have questions on use of this system: [techserv@promega.com](mailto:techserv@promega.com)

# 1

## Description

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The Maxprep® Liquid Handler automates post-processing normalization, dilution and transfer. These protocols allow the flexibility for administrators to create variant methods in the Maxprep® software that specify setup options to meet the needs of the laboratory. When starting a method, you can indicate the input and output labware for the method and import identifiers and concentration data for normalization.

# 2 Before You Begin

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## 2.1 Maxprep® Normalization, Sample Dilution and Sample Transfer Methods

As new Maxprep® Liquid Handler methods are released, they will be listed on the Promega website and available for download at:

**[www.promega.com/resources/software-firmware/maxprep-liquid-handler-methods/](http://www.promega.com/resources/software-firmware/maxprep-liquid-handler-methods/)**

This document presents guidelines for interaction with the post-processing Normalization, Sample Dilution and Sample Transfer methods on the Maxprep® Liquid Handler. Not all options are present in all methods, but the interaction with the user interface is common to all methods. Normalization and dilution volume settings are specified in variant methods and cannot be altered at run time. After selecting a variant method to run, you will enter processing parameters (e.g., Input Labware, Output Labware, identifier and concentration data) and be led through a series of user interface screens that detail placement of labware and reagents on the Maxprep® Liquid Handler. The Maxprep® Liquid Handler is provided with a PC and touch-screen monitor. Interactions with the user interface screen can occur using the mouse and keyboard, touch gestures on the monitor or a combination of both approaches.

## 2.2 Materials to be Supplied by the User

- Maxprep® 50µl Conductive Disposable Tips, Filtered (Cat.# AS9301)
- Maxprep® 300µl Conductive Disposable Tips, Filtered (Cat.# AS9302)
- Maxprep® Reagent Reservoir, 50ml (Cat.# AS9304)

## 2.3 Selecting a Maxprep® Normalization, Sample Dilution or Sample Transfer Method

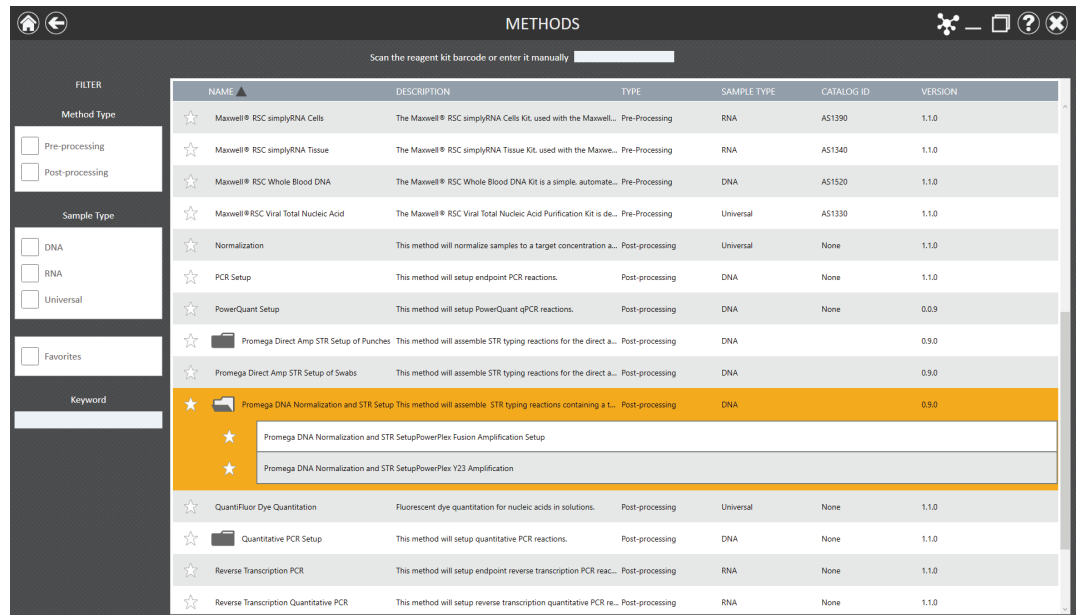
To start a method on the Maxprep® Liquid Handler, perform the following steps:

1. Start the Maxprep® software by double-clicking the Maxprep® software icon on the Windows® desktop. Alternatively, select the **Windows Start** button in the lower left corner of the screen, choose **All Programs**, open the Promega folder and select the **Maxprep** software icon.
2. From the Maxprep® software 'Home' screen (Figure 1), press the **Start** button.



**Figure 1. Maxprep® software 'Home' screen.** From the Maxprep® software 'Home' screen, select the **Start** button to begin the process of running a method.

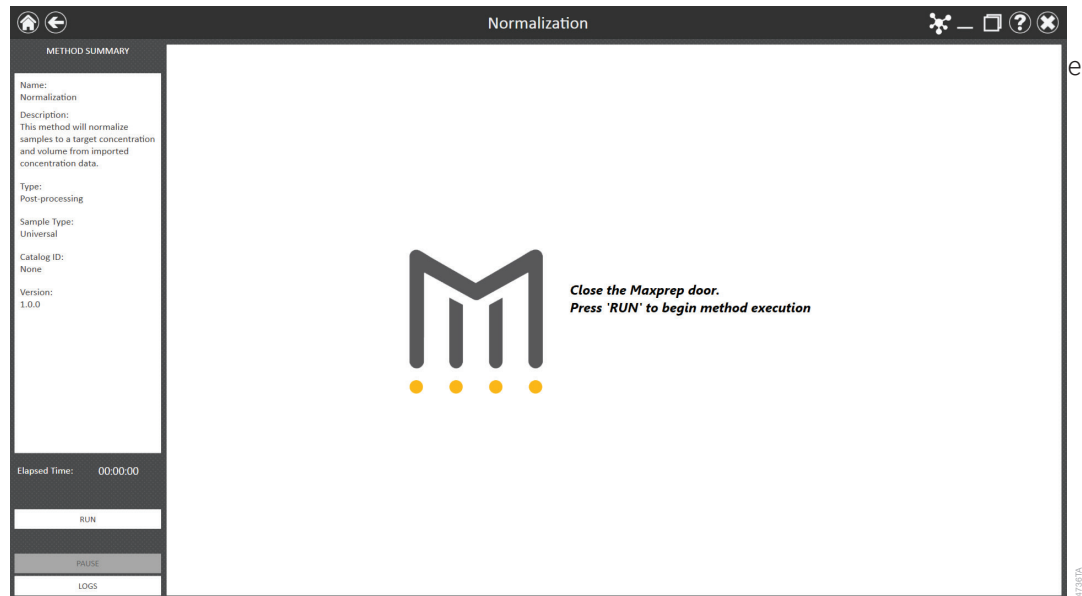
3. The 'Methods' screen (Figure 2) displays all of the methods that are installed in the Maxprep® software. Methods are shown either as single line entries or with a folder icon if the administrator has defined lab-specific variant versions of the Promega-supplied methods. Select the folder icon for the Normalization, Sample Dilution or Sample Transfer method to expand the list of variant methods that were created.



**Figure 2. 'Methods' screen.** The 'Methods' screen displays the methods installed in the Maxprep® software. Select the method to run, and then press the **Proceed** button.

4. Use one of the following two mechanisms to select a Normalization, Sample Dilution or Sample Transfer variant method:
  - a. Select the method or variant from the list of installed methods.
  - b. Use the Filter check boxes on the left side of the screen to display only post-processing methods, display only methods marked as Favorites or perform a keyword search for a specific word or phrase in any of the descriptive fields for the method. After filtering

the list, select the method or variant from the list of displayed methods.



**Figure 3. Method Run Environment screen.** The Method Run Environment screen displays a summary of the selected method on the left side of the screen. Close the door of the instrument and select the **Run** button to begin method execution.

## 2.4 Starting a Maxprep® Method

The Method Run Environment displays the name of the selected method in the title bar and a summary of the information describing the selected method on the left side of the screen. If an incorrect method was chosen, select the **Home** or **Back** button at the top left corner of the screen to return to the 'Home' screen or return to the 'Methods' screen, respectively.

To start method execution, close the door of the instrument and select the **Run** button in the lower left corner of the screen. Once method execution is started, the timer under the Elapsed Time: header will start, and the main portion of the screen will indicate that the system is initializing.



## 2.5 Entering Run-Specific Information

After the system has initialized, the Method Run Environment displays a user interface that requests the run parameters necessary to process this method.

The first screen of the user interface display requests information regarding Input Labware and Destination Labware for the normalization, dilution or transfer (Figure 4).

**Note:** When creating variant Normalization, Sample Dilution or Sample Transfer methods, the administrator defines the parameters specific to the method being performed. These parameters cannot be modified at run time. See Section 2.3 for information on creating Normalization, Sample Dilution and Sample Transfer variant methods.

**Input Labware**

Maxwell RSC 48 Trays  
Samples are in elution tubes

**Maximum Input Samples** 48

**Destination Labware**

Maxprep™ Deep Well Processing Plates  
Part number AS9307

**Run parameters are defined in method variants. These parameters include reaction components, standard curve settings, and controls usage. Click below to view the settings for this run.**

**Variant Information**

PREV NEXT

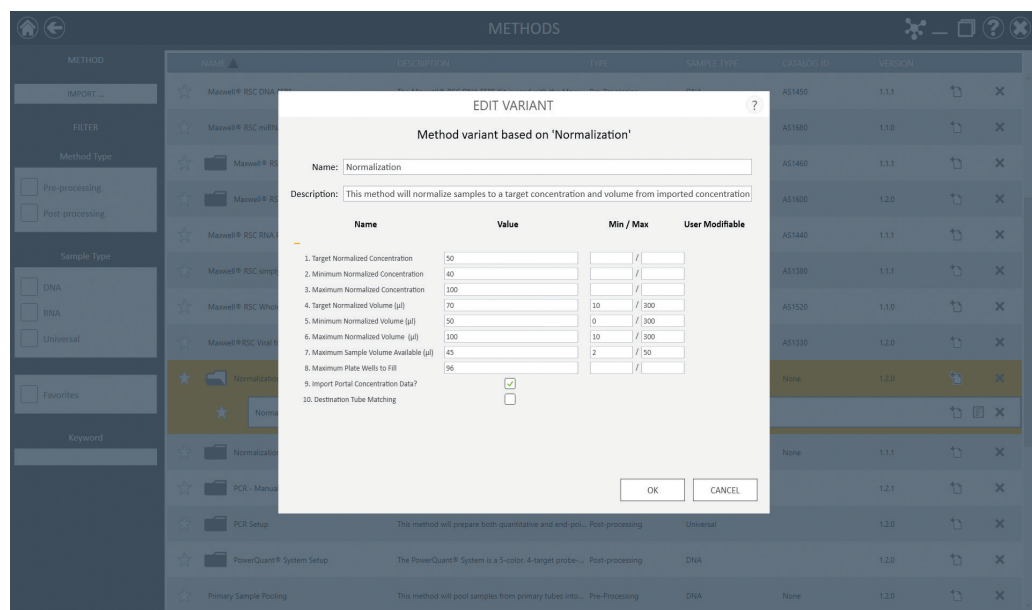
**Figure 4. General Run Parameters screen.** The General Run Parameters screen requests information about input labware and destination labware. Select the **Variant Information** button to view the administrator-defined settings for this Normalization, Sample Dilution or Sample Transfer method.



**Note:** You cannot specify tubes as both an input and destination labware option within a method run.

1. Use the drop-down menus to specify the Input Labware and Destination Labware to be used for this run. Samples are placed on the system in the Input Labware, and the final normalized, diluted or transferred samples are arrayed in the Destination Labware. Maxwell® Deck Trays (eluates), plates and tubes can all be used as input labware while only plates and tubes can be specified as destination labware options.

2. At the top right corner of the screen is an indication of the Maximum Number of Samples allowable within this method run. The number displayed is based on:
  - The number of sample positions in the input labware
  - The available space in the destination labware
3. To view the administrator-defined settings for this variant, press the **VARIANT INFORMATION** button (Figure 5).
4. Sample Dilution and Sample Transfer Only: Sliders along the bottom of the screen are used to specify the dilution factor (Sample Dilution method) or the transfer volume (Sample Transfer method) to be used in this method.
5. After entering values for Input Labware and Destination Labware, select the **Next** button.



**Figure 5. Viewing Normalization, Sample Dilution or Sample Transfer Setup information.** Press the **VARIANT INFORMATION** button on the interface to view the administrator-defined details for this variant method.

## 2.5.1 Input Labware Sample Information

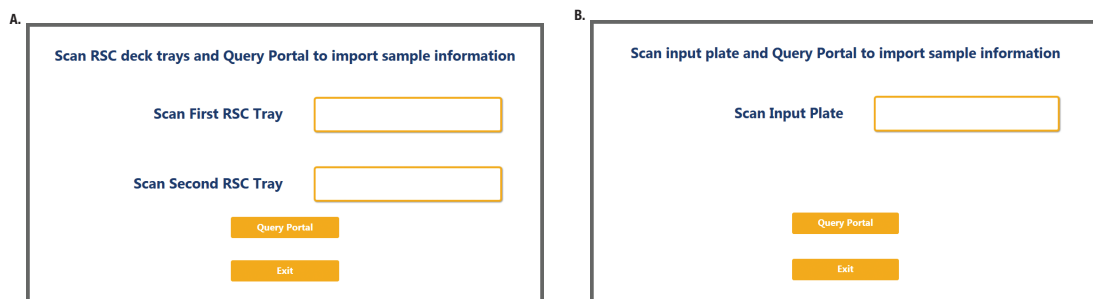
After selecting **Next**, the user interface requests information regarding the samples present in the input labware. The nature of the screen will depend on the type of input labware chosen and whether Portal is active.



**Note:** When not connected to the Portal software, the screens shown in Figure 6 are not displayed.

## Maxwell® Deck Trays or Plates as Input Labware

When connected to the Portal software, a bar code is requested for each deck tray or plate to be processed (Figure 6). The screens in Figure 6 are only displayed when the Maxprep® software is connected to the Portal software. Select the text box and scan or enter the deck tray bar code(s) for the selected input labware. After entering bar codes for the labware, press the **Query Portal** button to retrieve sample identifiers from the Portal software for the most recent activity associated with the labware. The number of sample identifiers retrieved from the Portal software is displayed on the screen. Press the **Exit** button to display any records retrieved from the Portal software query or to proceed without querying the Portal software and manually enter sample identifiers.



**Figure 6. Querying Portal for Maxwell® Deck Tray barcodes.** These screens are displayed only when the software is connected to the Portal software. Press the **Query Portal** button to search the Portal software for sample identifiers associated with the deck tray or plate bar code(s). Press **Exit** to display the sample identifiers retrieved from Portal or to proceed without querying Portal. **Panel A.** Scan or enter bar code information for Maxwell® Deck Tray(s) to be processed. **Panel B.** Scan or enter bar code information for the plate to be processed.

After pressing the **Exit** button, or when not connected to the Portal software, the user interface will display a representation of the labware. If applicable, any sample identifiers returned from the Portal software query are populated on the labware display and shown as black cartridge or well positions. Labware positions with no sample identifiers are displayed as gray cartridge or well positions. To enter or modify sample identifiers, select the desired labware position, then select the text box on the right side of the screen (Figure 7). Scan or enter the sample identifier information for the cartridge position. When entering sample identifiers, press the **Add Sample** button to accept the entry or press **Enter** on the keyboard to accept the information and move to the next position.

If more samples are present on the input labware than can be processed with this variant, a message will be displayed at the top of the interface screen indicating the number of excess samples that will have to be removed before proceeding. To remove samples from processing, select a position, Ctrl-click to select multiple positions or click and drag across several consecutive positions to select them. After selecting positions, press the **Remove Sample** button to remove them from being processed during this run.

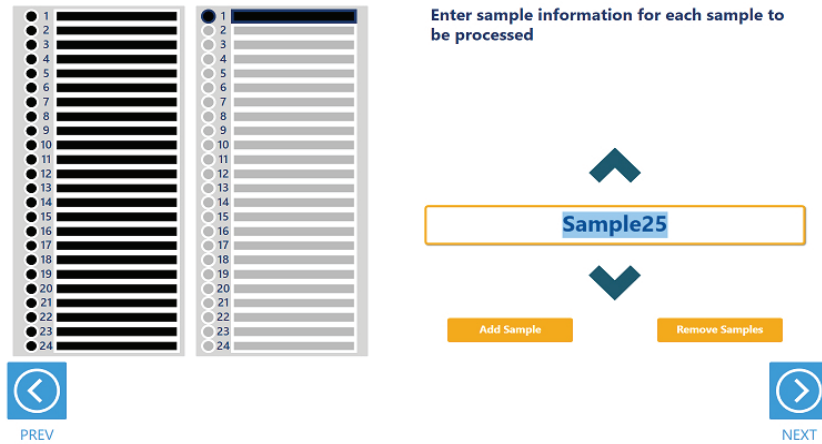


**Note:** When not connected to the Portal software, the **Requery Portal** button is not displayed.

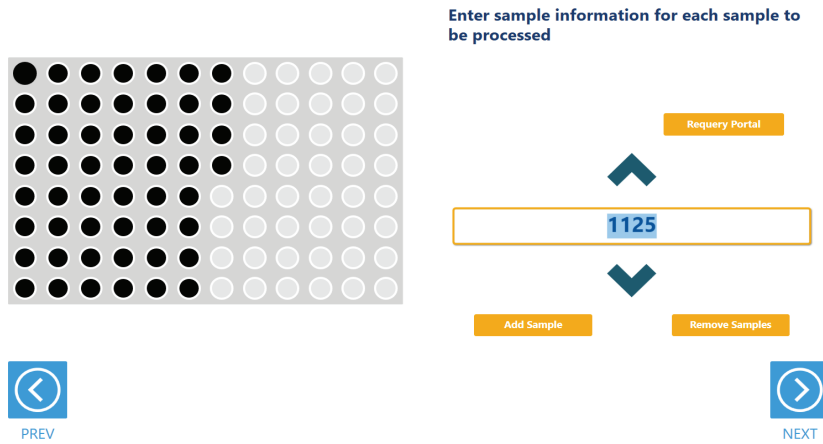
If sample identifiers are removed or edited incorrectly, it is possible to reset the labware to the original information retrieved from Portal. Press the **Requery Portal** button to repeat the process of retrieving sample identifiers from the Portal software for a piece of labware based on the labware bar code.

Once satisfied with the labware positions and sample identifiers to be processed, press the **Next** button to proceed to the next user interface screen.

A.



B.



14681CA

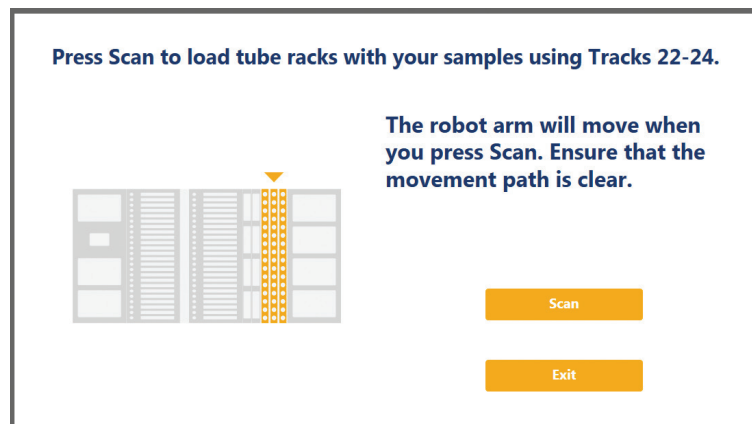
**Figure 7. Entering input sample identifiers.** Input labware is displayed on the interface and allows entry of sample identifier information. Any labware positions that have sample identifier information (either retrieved from Portal software or manually entered) are displayed in black. To enter sample identifiers, select the labware position and then select the text box on the right side of the screen. Scan or enter sample identifiers and press the **Add Sample** button to accept the sample identifier or press **Enter** on the keyboard to accept the sample identifier and move to the next position. **Panel A.** Interface screen for Maxwell® Deck Trays as input labware. **Panel B.** Interface screen for a plate as input labware.

## Tubes as Input Labware

When selecting tubes as an input labware type, the interface will prompt you to scan bar codes on three tube racks at Tracks 22–24 (Figure 8). Scanning tube racks will determine the type of tube rack being used, the types of tubes defined for that rack type and the sample identifiers for each tube.



**Note:** Ensure that the movement path is clear prior to scanning tube racks.



**Figure 8. Scanning tube racks.** Tube racks at Tracks 22–24 must be scanned when tubes are selected as an input labware type. Scanning tube racks will determine the type of tube rack being used, the types of tubes defined for the rack type and the sample identifiers for each tube.

To scan sample tube racks:

1. Remove tube racks from the system. Load tubes into the tube racks with barcodes visible in the windows on the right side of the carrier.
2. Load the tube racks on the instrument to identify the type of tube rack being used and scan bar codes on the individual tubes.
  - a. Press the **Scan** button.
  - b. The instrument arm will slowly move to the position for scanning the first primary sample tube rack.
  - c. With the tube rack removed from the system, the green loading light where the tube rack should be loaded will flash.
  - d. Place the back edge of the tube rack on the loading platform so that the rearmost barcode on the tube rack (rack identifying barcode) is just in front of the bar code scanner.
  - e. Slide the tube rack into the system until it fully contacts the back of the instrument. During this time the bar code scanner will flash each time it reads a tube position.

**Note:** Do not remove or insert tube racks while the instrument arm is moving. After scanning a tube rack, wait until the instrument arm has moved to the next position before inserting a tube rack.

- f. When the tube rack is fully seated in the instrument, the loading light at the front of the instrument will stop flashing. Approximately 5 seconds after the tube rack is loaded into the instrument, the instrument arm will slowly move to the right for loading of the next
  - g. Repeat Steps c–f for all three tube racks. If sample tubes are not present in all three carriers, press **Stop** when the instrument arm moves after scanning the last carrier containing tubes.
3. Once all tube racks are scanned, the interface will display the number of samples that were successfully scanned. Press the **Exit** button to proceed. If multiple tube labware definitions exist for a given rack, a pop-up screen is displayed to select which tube type is being used on that rack (Figure 9). Select the tube type being used for each rack from the drop-down menus. All tubes on an individual tube rack must be of the same type.

**Multiple tube types possible for the scanned tube racks.**  
Select the correct labware for each tube rack.

**Rack 1: Track Position 22**

2.0 ml Screw Cap Tubes  
Sarstedt Tubes

**Rack 2: Track Position 23**

2.0 ml Screw Cap Tubes  
Sarstedt Tubes

**Rack 3: Track Position 24**

2.0 ml Screw Cap Tubes  
Sarstedt Tubes

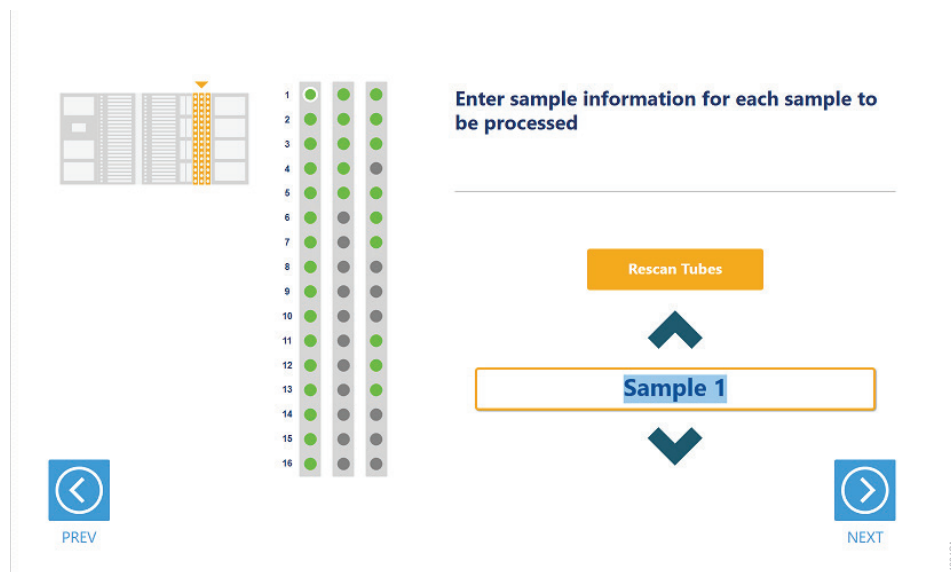
Exit

**Figure 9. Choosing a tube type.** When multiple tube types are defined for a tube rack, you need to select which tube type is being used on any given rack. Each tube rack can use a different tube type, but all tubes within a single rack must be of the same type.

The next user interface screen displays the three tube racks with a green indicator at any position where bar code information was scanned (Figure 10). Select a tube position and confirm the bar codes for each tube using the **Up** and **Down** arrow keys to navigate through tube positions. If no bar codes are present on the tubes, it is still required to enter sample identifier information for each position to be processed. Select the tube position and enter sample identifier information. Press **Enter** on the keyboard to accept the sample identifier and advance to the next tube position.

If more samples are present on the input labware than can be processed with this variant, a message will be displayed at the top of the interface screen indicating the number of excess samples that will have to be removed before proceeding. To remove samples from processing, select a tube position and press **Delete** on the keyboard. Use the **Up** and **Down** arrow keys on the keyboard to navigate through tube positions to delete additional sample identifiers. To rescan tube bar codes, change tube racks or specify a different tube type, press the **Rescan Tubes** button. This will reopen the screen used to scan tube racks (Figure 8).

Once satisfied with the labware positions and sample identifiers to be processed, press the **Next** button to proceed to the next user interface screen.



**Figure 10. Tube bar code confirmation/entry.** Tube positions for which bar code information was scanned are indicated in green. All samples to be processed must have sample identifier information. If no bar codes are being used, manually enter a sample identifier for each position to be processed by selecting the position and entering an identifier.

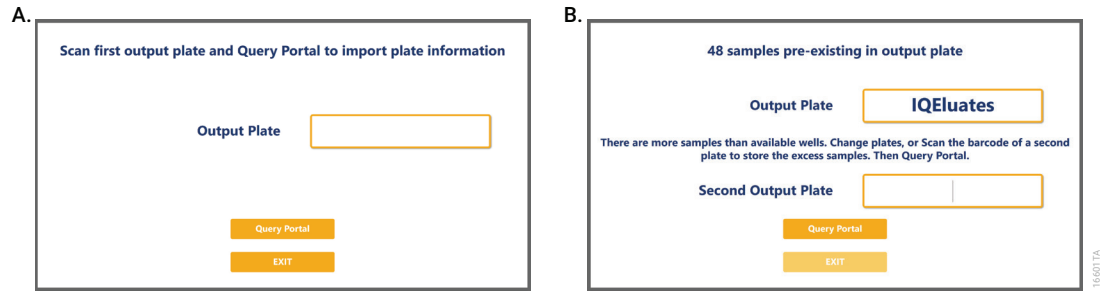
## 2.5.2 Plates as Destination Labware



**Note:** When not connected to the Portal software, the screens shown in Figure 11 are not displayed.

When connected to Portal software, a bar code is requested for the plate to be used as output labware (Figure 11, Panel A). The screen in Figure 11, Panel A, is only displayed when Maxprep® software is connected to Portal software. Select the text box and enter or scan the plate identifier. After entering an identifier for the plate, press the **Query Portal** button to retrieve sample identifiers already existing on this plate from a previous run stored in the Portal software. The number of pre-existing samples on the plate is displayed on the screen. Press the **Exit** button to accept this plate and proceed.

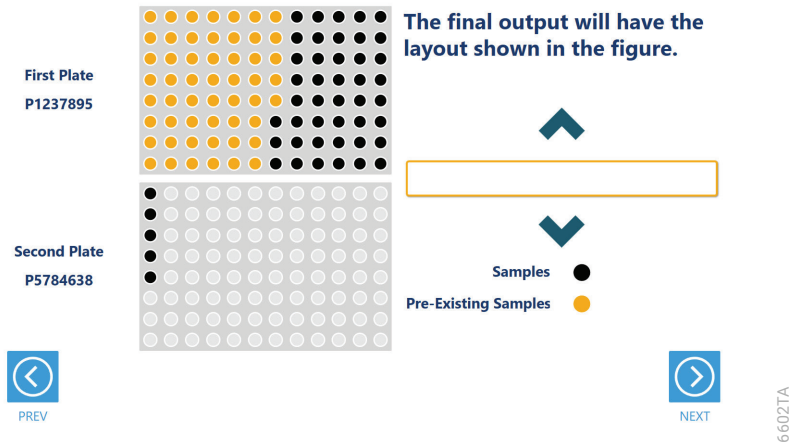
If there are more samples than will fit in the available wells of the output plate, you will be prompted to scan a second output plate to hold the remaining samples (Figure 11, Panel B). Select the Second Output Plate text box and enter or scan the plate identifier for the second output plate and press the **Query Portal** button. The number of pre-existing samples on the second output plate is displayed on the screen, and the **Exit** button becomes active if there are sufficient wells on both plates to contain the number of input samples specified. Press the **Exit** button to accept these two output plates and proceed to the next screen.



**Figure 11. Scan Output Plate screen. Panel A.** When plates are used as an output for transfer and dilution methods, the user is requested to scan a plate ID. If there are more samples than will fit on the output plate, a second output plate identifier is requested. **Panel B.** Prompt shown when more than a single output plate is needed.

After pressing the **Exit** button, or when not connected to the Portal software, the user interface displays a representation of the output labware (Figure 12). If applicable, any sample identifiers retrieved from the Portal software query are populated on the output plate(s) as yellow well positions. All samples to be transferred to the output plate(s) in this run are displayed as black well positions. To view sample identifiers, select the desired well position, and the sample identifier for that well position is shown in the text box to the right of the plates.

When finished reviewing the output plate(s), press the **Next** button to proceed to the next user interface screen.



**Figure 12. Display of Output Plate(s).** Locations for samples to be transferred in this method run are displayed as black well positions on the output plate(s). Pre-existing samples on the output plate(s) are displayed as yellow well positions. Either one or two output plates may be shown, depending on the run conditions.



### 2.5.3 Import of Sample Identifier and Concentration Data (Normalization Only)

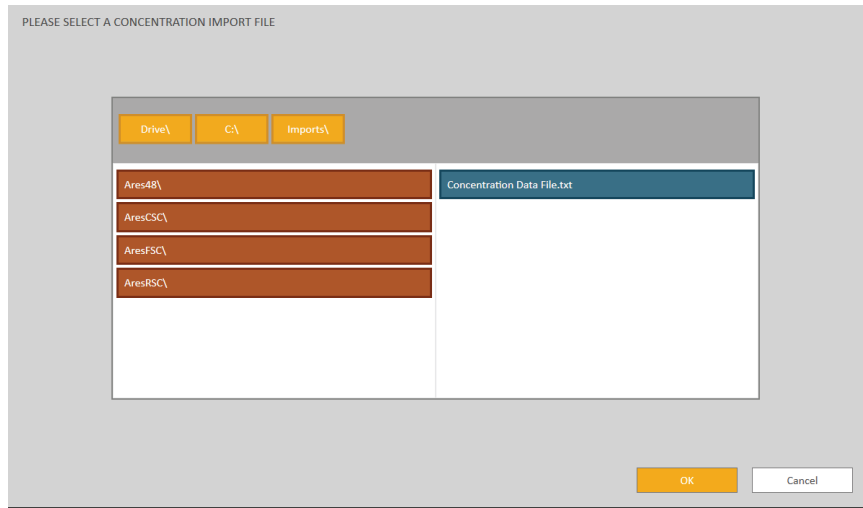
When performing normalization, you need to import the sample identifiers and concentrations of all samples that are to be processed. This can be done either by using the file browser (Figures 13 and 14) or importing the concentration file through Portal software (Figure 15). To use the file browser (Figure 13), the current path will be shown in yellow boxes along the top of the screen. Touch any aspect of the path to navigate to the desired folder. Touch the **Drive\** button to select the drive in which to search. Folders within the current path are shown as red rectangles on the left side of the screen. Files will be shown as blue rectangles (yellow when selected) on the right side of the screen. Click the blue rectangle corresponding to the desired import file to highlight it, and then press the **OK** button. Import files must be tab-delimited text files containing a row indicating column headers and must minimally contain sample identifier and concentration information.

After selecting an import file, a screen is displayed to indicate the structure of the import file (Figure 14). Use the Header Row drop-down menu to indicate which row of the file contains header information. After specifying the Header Row, use the Sample ID Column and Sample Concentration Column drop-down menus to select the headers that correspond to columns that contain sample identifier and sample concentration information. Once all information pertaining to the structure of the import file is set, touch the **Import** button to match the file contents to the sample identifier information associated with the input labware. On the right side of the screen, the number of samples imported from the file and the number of matching sample identifiers in the input labware are indicated. To select a different import file, press the **Select File** button. Once satisfied with the import file settings, press **Next** to proceed to the next user interface screen.

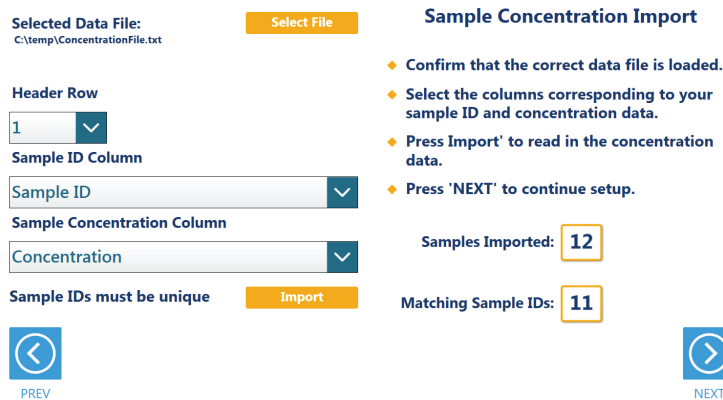


**Note:** Samples with concentration values less than or equal to zero will not be processed.

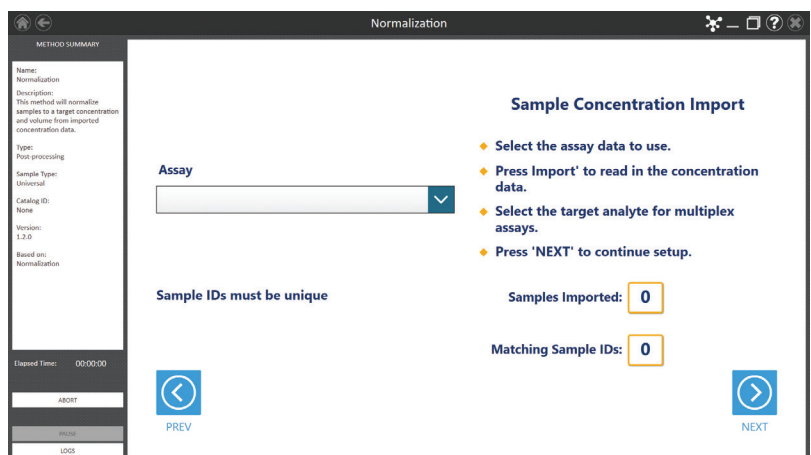
To use Portal software to import the sample identifier and concentration data, select **Import Portal Concentration Data** either in the method variant or when prompted in the user interface screen. This option will display a Portal import screen (Figure 15) after inputting labware sample information. Select the assay that contains the sample identifier and concentration data using the Assay drop-down menu (see the *Portal Access Technical Manual* #TM549, for assistance on creating an assay). On the right side of the screen, the number of samples imported from the file and the number of matching sample identifiers in the input labware are indicated. Once satisfied with the import file settings, press **Next** to proceed to the next user interface screen.



**Figure 13. Import File Browser.** Use the import file browser to identify the tab-delimited text file containing sample identifier and concentration information. Yellow boxes at the top of the screen indicate the current drive and path. Use the red boxes to select folders within the current path. Import files are displayed as blue boxes on the right side of the screen. Select a valid import file, and press **OK** to proceed.



**Figure 14. Specifying Import File Structure.** Use the drop-down menus on this screen to specify the position of the Header row, the column containing Sample IDs, and the column containing Sample Concentrations in the import file. Press **Import** to assess the number of sample records and the number of matching sample identifiers present in the import file. To select a new import file, press the **Select File** button.



**Figure 15. Portal Sample Concentration Import.** Use Portal to import sample identifier and concentration information. Use the drop box to select the "Assay" that contains the concentration data.

## 2.6 Instrument Setup Instructions

Instrument setup proceeds from left to right on the Maxprep® Liquid Handler. The loading platform of the Maxprep® Liquid Handler uses a track system to indicate where carriers are loaded on the system. In these instructions each carrier referenced will list the starting and ending track number that are spanned by the carrier. Make sure that carriers are placed correctly on the instrument at each step of the user interface. Screens are presented to indicate the types of labware that should be placed on the instrument, volumes of reagents that should be provided and allow entry of reagent barcode information.

All deck setup screens display a miniature view of the entire instrument in the upper left corner of the screen with the current position highlighted. Below this image is a summary of the selected run parameters. On the right side of the screen is a depiction of the carrier and instructions for what should be present at each position on the carrier. For each position where labware or reagents must be placed there is a check box. As labware is loaded at each position, check the box to indicate that the instruction was performed. It is not possible to proceed to the next instrument setup screen until a check is present in all check boxes on the screen.

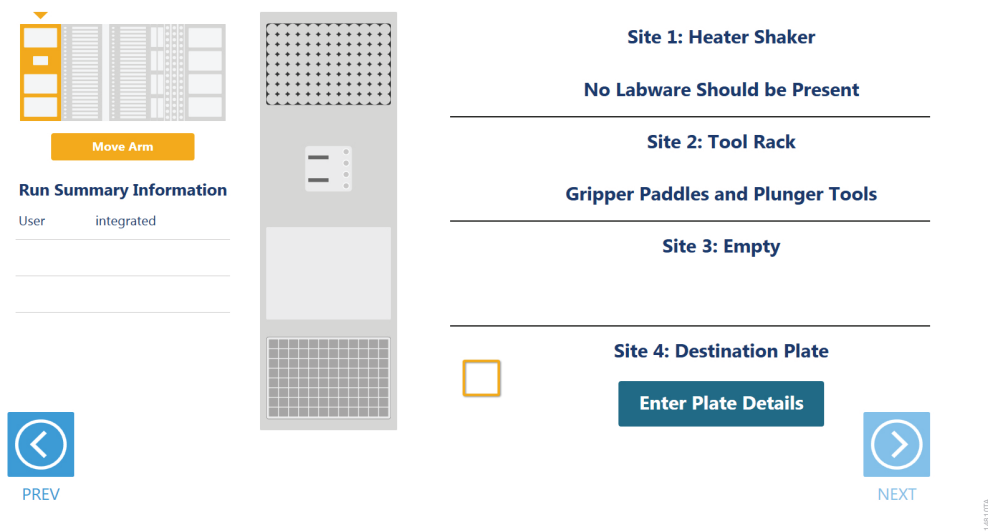
### 2.6.1 Utility Carrier (Tracks 1–6)

The Utility Carrier is a fixed position and cannot be removed from the instrument. It contains a Heater/Shaker unit at Site 1 (back of the instrument), instrument tools (gripper paddles, plunger tools) at Site 2 and two labware positions at Site 3 and Site 4 (front of the instrument; Figure 16).

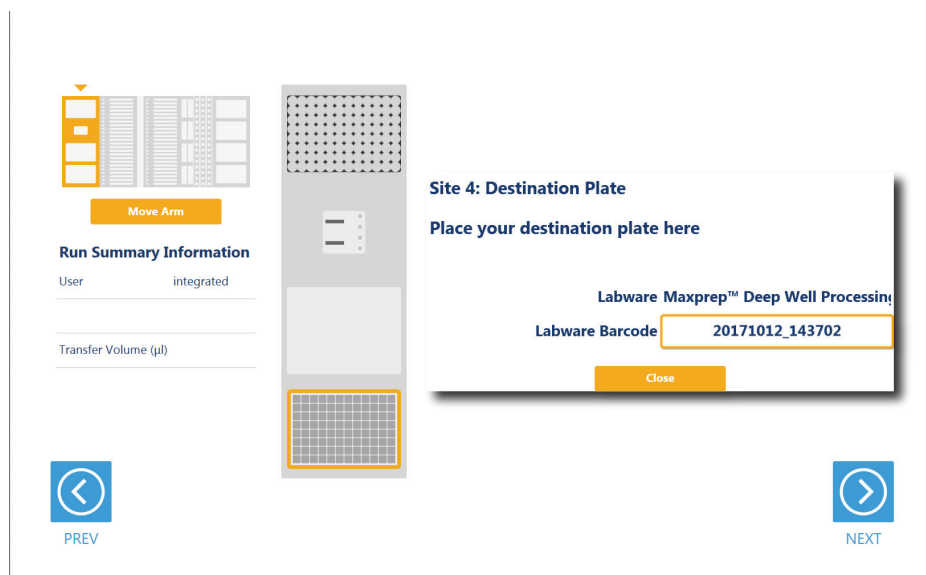
Follow the information on the right side of the screen regarding placement of labware. For instance, on the screen in Figure 16, there should be no labware present on the Heater Shaker device at Site 1, the Gripper Paddles and Plunger Tools are present at Site 2, no labware is present at Site 3 and a Destination Labware Plate is present at Site 4.

For the Destination Labware Plate(s) at Sites 3 and 4, selecting the **Enter Plate Details** button or the check box displays details for the Destination Labware Plate(s) (Figure 17). Place the indicated Destination Labware at Sites 3 and 4 as specified on the screen. By default, the barcode for the Destination Labware Plate is set to the date and time the method was started. When connected to the Portal software, the details for the Destination Labware Plate(s) shows the labware barcode(s) entered previously.

After placing labware, check the boxes next to each position to activate the **Next** button at the bottom right corner of the screen. Press the **Next** button to proceed to continue instrument setup.



**Figure 16. Deck Setup screen for the first carrier.** This carrier cannot be removed from the system. It contains a Heater/Shaker for incubation of samples, tools and two labware positions. Place the indicated labware on the carrier, and check the boxes to activate the **Next** button. Press **Next** to continue instrument setup.



**Figure 17. Destination Labware Plate Details screen.** For the Destination Labware Plate at Site 4, press the **Enter Plate Details** button to display information about the plate. When allowed, you can select the Labware Barcode text box to scan or enter a bar code for the Destination Labware Plate. The default bar code for the plate is the date and time the Destination Labware method was started.

## 2.6.2 Maxwell® Deck Tray Carriers (Tracks 7–12, 14–19)

The Maxwell® Deck Tray Carriers are used to place either Maxwell® RSC or Maxwell® RSC 48 Deck Trays or a plate on the instrument as input labware. Instructions for both input labware types are shown below.

### Notes:

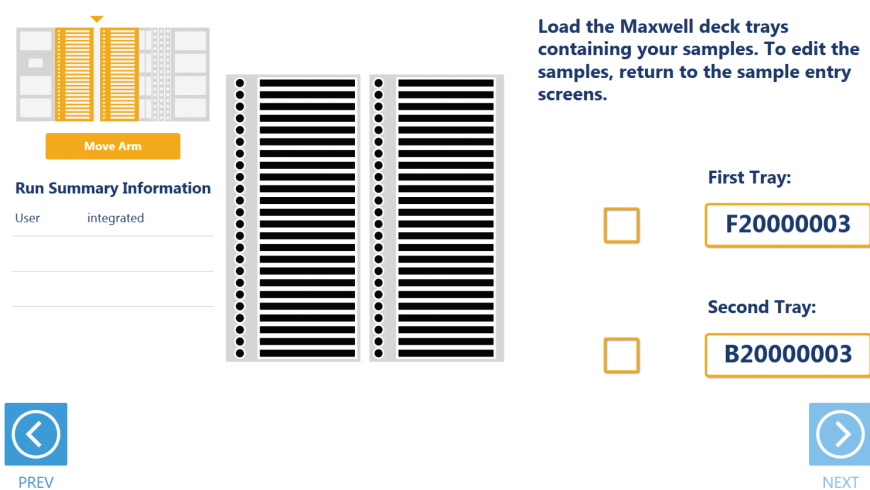
- Refer to the miniature instrument image on the left side of the screen to see which position the displayed Maxwell® Deck Tray Carriers should occupy on the instrument.
- The Maxwell® Deck Tray Carriers are not intended to be directly next to each other on the instrument. A Reagent Carrier should be placed or an empty track should be left at Track 13 between the Maxwell® Deck Tray Carriers to make sure they are loaded correctly.

### Maxwell® Deck Trays as Input Labware

There are two types of Maxwell® Deck Tray Carriers, one for Maxwell® RSC Deck Trays and one for Maxwell® RSC 48 Deck Trays. The choice of which deck tray type will be used for the run is made when the input labware is selected for the run. These carriers can be removed from the system and replaced depending on the type of deck trays that are being used for this run. The Normalization, Sample Dilution and Sample Transfer methods use eluates in the Maxwell® elution tube position as samples for the run. In the center of the screen (Figure 18) is an image of the deck trays where the positions to be processed are indicated as black cartridges. If only one deck tray is to be processed, the other deck tray will be shown as a gray rectangle with no cartridges present. Elution tubes should be securely loaded with the caps open on the deck

trays at the indicated positions. Place Maxwell® Deck Trays, minimally containing the specified number of elution tubes placed at the elution positions, on the Maxwell® Deck Tray Carriers. Shown on the right side of the screen are the barcodes for each Maxwell® Deck Tray. The first tray is placed on the left carrier at Tracks 7–12, and the second tray is placed on the right carrier at Tracks 14–19.

Check the boxes next to the deck tray bar codes as you load the Maxwell® Deck Trays on the Maxprep® Liquid Handler. Once the boxes are checked, the **Next** button in the bottom right corner of the screen will become active. Press the **Next** button to move to the next instrument setup screen.



**Figure 18. Maxwell® Deck Tray Carriers.** These carriers are used to hold Maxwell® RSC or Maxwell® RSC 48 Deck Trays (Front and Back). Place Maxwell® Deck Trays with elution tubes at the indicated positions on the deck tray carriers as instructed.

### Plate as Input Labware

When a plate is selected as an input labware, the leftmost Maxwell® Deck Tray Carrier is used to place the input plate on the instrument. Either type of Maxwell® Deck Tray Carrier can be used for positioning the input plate. Remove the Maxwell® Deck Tray (if present) and the elution magnet from the Maxwell® Deck Tray Carrier.

Place the input plate on the front plate position of the Maxwell® Deck Tray Carrier as indicated.

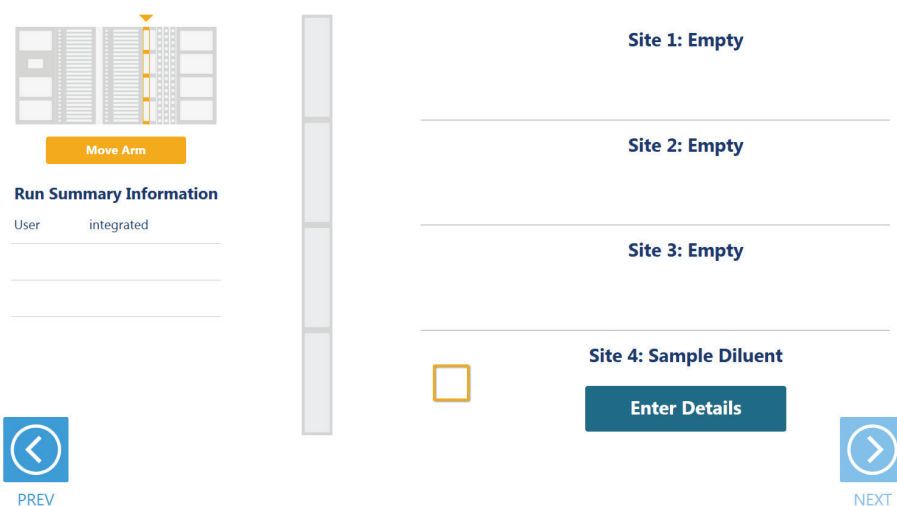
Check the box next to the input plate location as you load the plate on the Maxprep® Liquid Handler. Once all boxes on the screen are checked, the **Next** button in the bottom right corner of the screen will become active. Press the **Next** button to move to the next instrument setup screen.

### 2.6.3 Reagent Carriers (Tracks 20, 21)

The Reagent Carrier screens display the reagents that should be placed at each site on a reagent carrier (Figure 19). Sample Diluent (if necessary) is placed in a Maxprep® Reagent Reservoir, 50ml, as indicated.



**Note:** Refer to the miniature instrument deck layout on the left side of the screen to see which position the displayed reagent carrier should occupy on the instrument.



**Figure 19. Reagent Carrier screens.** The name of the reagent to be placed at each carrier site is indicated. Press the Details button for any individual site to see details and enter reagent lot information.

Press the **Enter Details** button to see details specific to the reagent and site on the reagent carrier and enter reagent lot information if desired (Figure 19). When finished viewing instructions for a reagent site press **Close** to leave the reagent details and return to the main reagent carrier screen. The act of viewing reagent details will cause the check box for the reagent to be checked. All check boxes must be checked to activate the **Next** button on the main reagent carrier screen. Press **Next** to move to the next instrument setup screen.



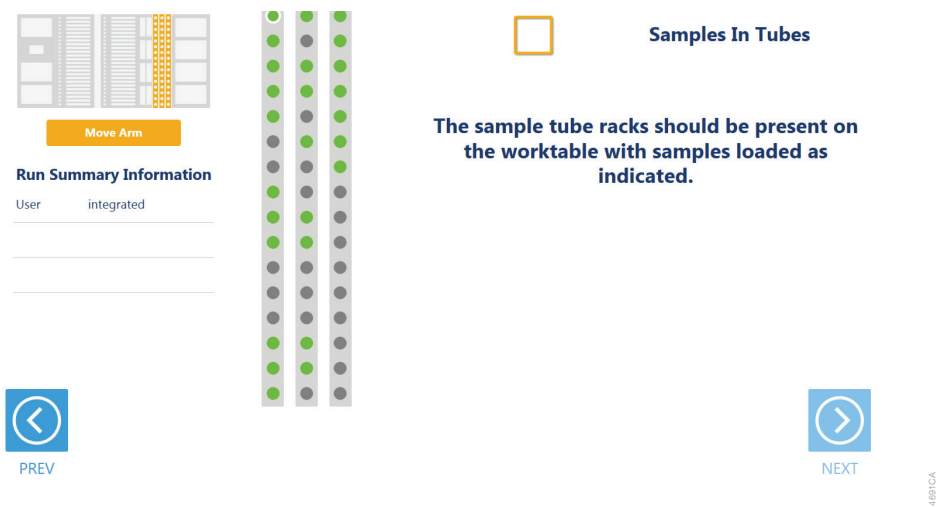
**Note:** For best results use TE or TE<sup>-4</sup> as the Sample Diluent.

Normalization and Sample Dilution methods require Sample Diluent to be placed at Site 4 (front site) on the first reagent carrier in a reagent reservoir. Transfer at least the indicated volume of reagent into a Maxprep® Reagent Reservoir, 50ml, and place it at the designated site on the carrier. If there is not sufficient reagent present in the trough to complete the run, a warning prompt will be shown to add more of the specified reagent to the trough position for this reagent.

## 2.6.4 Sample Tube Carriers (Tracks 22, 23, 24)

When tubes are selected as the input labware, the tube carriers at Tracks 22–24 will be displayed (Figure 20). Scanning or entry of sample tube bar codes occurred earlier in the method (see Section 2.5, Figure 8), and the tube racks should already be present at these three track positions. Confirm that tubes are present at the positions indicated in green on each of the tube racks displayed. All tubes within each tube carrier should be of the same type. Check the box to activate the **Next** button. Press the **Next** button to proceed to the next instrument setup screen.

When tubes are selected as output labware, the tube carriers at Tracks 22–24 will be displayed with a **Scan** button on the screen. Scanning or entry of sample tube bar codes occurs during instrument setup for tubes as a destination labware. Press the **Scan** button to start the process of scanning tubes, following the instructions in Tubes as Input Labware above. While multiple types of tube carriers can be loaded, all tubes must be of the same type within a carrier. After scanning tubes, confirm or enter sample tube identifiers and positioning. Press the **Next** button to proceed to the next instrument setup screen.

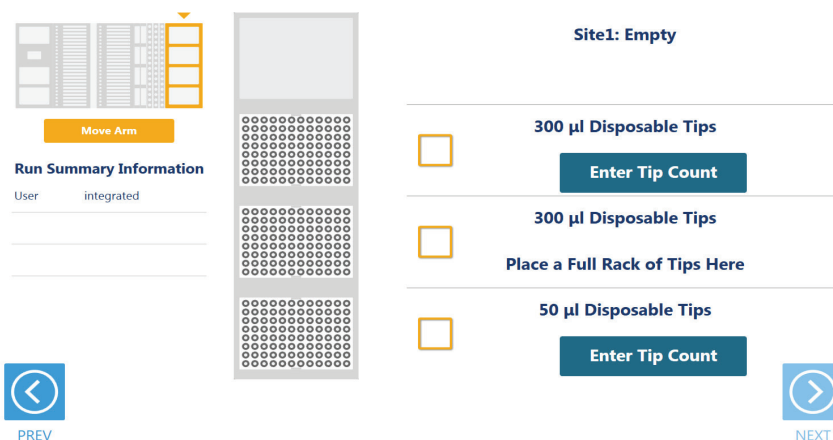


**Figure 20. Sample Tube Rack screen.** When tubes are the input labware, the three sample tube racks are displayed. Confirm that tubes are present at each position indicated in green and that all tubes within a rack are of the same type. When tubes are used as the destination labware, you will be prompted to scan tube bar codes.



## 2.6.5 Tip and Plate Carrier (Tracks 25–30)

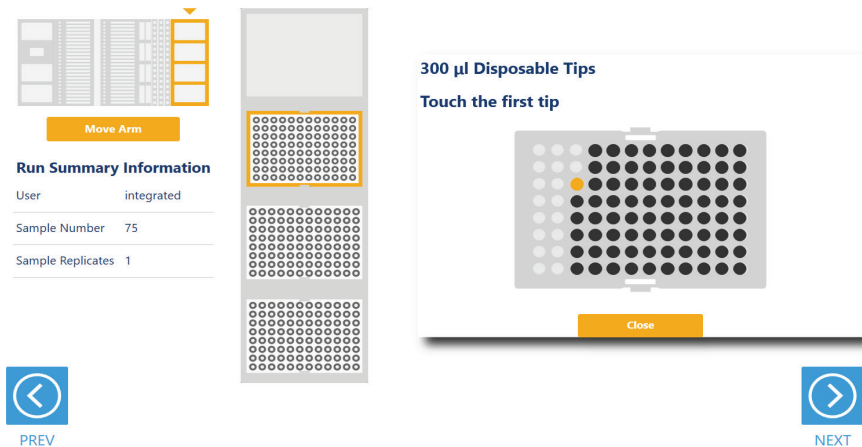
Tips are placed on the tip and plate carrier (Figure 21). Site 1 on this carrier is a plate position that is left empty.



**Figure 21. Tip and Plate Carrier screen.** Place the specified labware at each site. Site 1 contains no labware. Sites containing a tip rack indicate the type of tips that should be placed there and whether a partial or full rack of tips needs to be placed. For partial tip racks, press the **Enter Tip Count** button to specify the first available tip in the partial tip rack.

Sites 2–4 on this carrier are used to hold tip racks. Place tips of the specified type at each site on the carrier. Sites at which either a full or partially filled tip rack can be placed will have an **Enter Tip Count** button. Press the **Enter Tip Count** button and select the first available tip present in the tip rack (Figure 22). Entering a tip count and pressing the **Close** button will act to check the check box for the specified site. If a tip count is not entered, the software will assume a full rack of tips is located at the specified position. For all other sites, once you have added the requested labware, check the check box next to the site. Only after all check boxes on the screen are checked will the **Next** button become active. Press the **Next** button to move to the next screen.

**Note:** Confirm that the appropriate tips are placed at each position before starting the method. Tip types used at each position differ between preprocessing and post-processing methods



**Figure 22. Selecting the first tip in a partial tip rack.** For sites at which a partial or full tip rack can be placed, press **Enter Tip Count** to specify the first tip present (in gold) in the partial tip rack. Press **Close** to return to the display of all sites on the carrier. Check all check boxes after loading labware to proceed.

## 2.6.5 Final Screen

The final screen of the instrument setup presents a list of items that should be checked before starting the run. Confirm that:

- All carriers are completely seated in the instrument
- All labware are loaded at the correct locations
- Tip waste bin is empty if necessary
- The door of the instrument is closed

Once the items in the list are checked and the door of the instrument is closed, press **Next** to start automated sample processing (Figure 23). This is the last chance to return to any of the instrument setup screens and confirm instrument setup before sample processing will begin.

During the run, if there is a need to pause instrument operation in order to resolve any unforeseen issues, press the **Pause** button in the lower left corner of the screen. If it is necessary to abort the run for any reason, press the **Abort** button in the lower left corner of the screen.



**Setup Complete**

- ◆ Ensure that all carriers are completely pushed back.
- ◆ Verify that all reagents and labware are loaded at the correct locations.
- ◆ Empty the waste bin, if necessary.
- ◆ Close the door.
- ◆ Press 'NEXT' to begin processing.

**Run Summary Information**

|                   |            |
|-------------------|------------|
| User              | integrated |
| Sample Number     | 75         |
| Sample Replicates | 1          |

PREV

NEXT

14852CA

**Figure 23. Final instrument setup screen.** This screen presents a list of items that should be checked before starting automated processing. It also provides a final chance to return to any of the previous instrument setup screens before automated processing begins. To start processing, close the instrument door and press the **Next** button.

## 2.7 Maxprep® Liquid Handler Normalization, Sample Dilution and Sample Transfer Protocol

The Maxprep® Liquid Handler will normalize, dilute or transfer samples from the input labware and array them in the destination labware. The following steps are performed by the Maxprep® Liquid Handler:

1. **Optional:** The system checks that there is sufficient volume in the sample diluent trough to dilute samples.
2. **Optional:** Transfer of sample diluent required for normalization or dilution from the sample diluent trough to the destination labware.
3. Transfer of samples to the destination labware based on the settings in the variant method.
4. Method is complete. Open instrument door and remove the normalized, diluted or transferred samples. Remove primary samples, plates and used tips from the waste bin and discard as hazardous waste following your institution's recommended guidelines. Either discard or tightly cap and store remaining reagents.



Consumables for Maxprep® methods are designed to be used with potentially infectious substances. Use appropriate protective equipment (e.g., gloves and goggles) when handling infectious substances. Adhere to your institutional guidelines for the handling and disposal of all infectious substances when used with this system.

# 3

## Potential Errors and Warnings

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The Maxprep® Normalization, Sample Dilution and Sample Transfer methods are designed to provide notification and resolution options for several potential error and warning states. Below are listed several possible error and warning states that may be observed during a method. Always carefully read any warning or error messages to find out how to proceed. If in doubt about how to proceed with any error state, the safest option is to choose the Abort button to end the run.

### 3.1 Intrusion Sensor

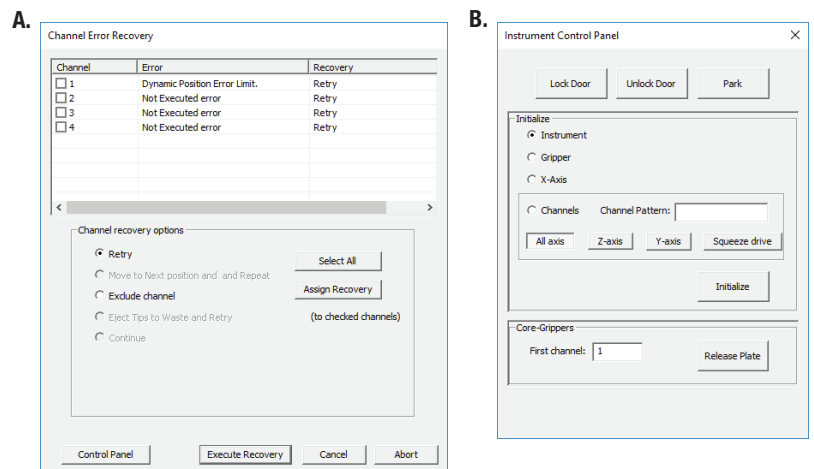
The intrusion sensor on the Maxprep® Liquid Handler checks for any potential physical obstructions that could prevent gantry movement on the instrument. Prior to any instrument movement (e.g., initialization, bar code scanning, arm movement, resuming a method after a pause, performing a maintenance method), always be sure to check that all carriers on the system are fully pushed to the back of the instrument and that nothing could impede the progress of gantry movements. An LED on the left front side of the deck provides a visual indicator of the intrusion sensor state. When no physical obstruction is detected, the LED is orange, but when the LED is green, a carrier or other physical obstruction has been detected by the intrusion sensor. Make sure that all carriers are fully seated on the system and that the intrusion sensor LED is orange before proceeding with any instrument operation that will result in movement of the gantry.

If the intrusion sensor does detect a physical obstruction to the gantry movement, the system will display an error message (Figure 24) when the gantry attempts to move. This error does not result in an aborted run and the run can continue if you follow the steps below.

**Note:** During automated bar code scanning, if the intrusion sensor detects an obstruction, the error below will not be displayed and recovery is not possible. In this case, it will be necessary to abort the run, power cycle the Maxprep® Liquid Handler, and start the method run again.

1. On the 'Channel Error Recovery' screen (Figure 24, Panel A), press the **Control Panel** button in the lower left corner to open the "Instrument Control Panel" screen (Figure 24, Panel B).
2. On the 'Instrument Control Panel' screen, press the **Unlock Door** button. Open the door of the instrument and push all carriers back. Confirm that the intrusion sensor does not detect an obstruction by checking that the intrusion sensor LED on the left side of the instrument is orange.

3. Close the instrument door and then press the **Lock Door** button on the 'Instrument Control Panel' screen.
4. In the Initialize area of the 'Instrument Control Panel' screen, make sure the radio button for Instrument is selected and then press the **Initialize** button. The gantry of the Maxprep® Liquid Handler will initialize.
5. Close the 'Instrument Control Panel' screen using the **X** button in the upper right corner of the screen.
6. On the 'Channel Error Recovery' screen, in the Channel Recovery Options area, press the **Select All** button. This will check the boxes for each channel at the top of the screen.
7. Press the **Execute Recovery** button at the bottom of the 'Channel Error Recovery' screen to retry the gantry movement and continue the method run.



**Figure 24. Error caused by a physical obstruction detected by the intrusion sensor. Panel A.** When the intrusion sensor on the Maxprep® Liquid Handler detects a physical obstruction that would impede gantry movement prior to gantry motion, the error above is displayed. **Panel B.** Follow the instructions in the text above to reinitialize the instrument and continue processing.

## 3.2 Unable to Load Tips

As part of a normal method run it is necessary for the instrument to load tips on the pipetting channels. The instrument will attempt to load tips at a position twice and will automatically move to the next tip position. If the instrument runs out of tips of a given type, a warning will be displayed to replace that tip type with a full tip rack.

## 3.3 Insufficient Tips

While the Normalization, Sample Dilution and Sample Transfer methods were developed to minimize the chance of consuming all available tips during a run, there is still a possibility that a warning message will be displayed indicating that there are no longer tips available on the tip and plate carrier (Figure 25). If this warning occurs, the instrument will pause operation and unlock the door. Open the door of the instrument, add the appropriate tip type to the first site for that tip type, close the door and press **OK** to resume processing.



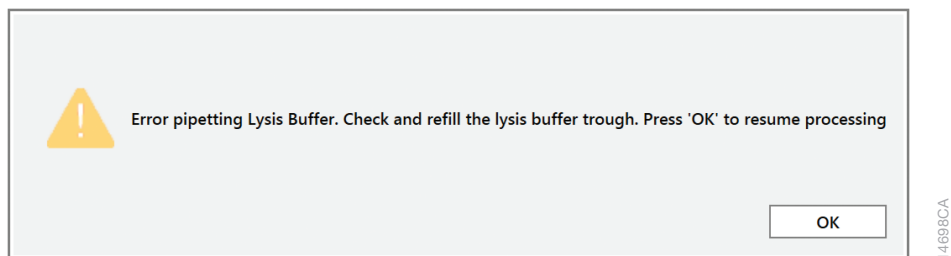
**Figure 25. Insufficient tips on the system to complete a method.** In the event that all tips of a given tip type are consumed during a run, the instrument will pause and unlock the door. Open the door, load more tips of the indicated type on the tip and plate carrier, close the door and press **OK** to resume processing.

## 3.4 Insufficient Sample

The system does not check that sufficient sample is present in sample labware. Make sure to provide sufficient volume of samples based on the sample volume indicated in the method or method variant.

## 3.5 Insufficient Liquid

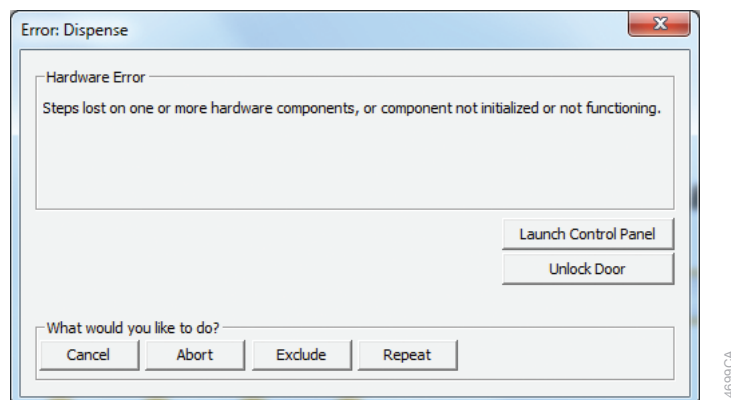
If the system detects an insufficient volume of reagent in the reagent trough to transfer the volume of reagent specified for the run, a warning is displayed (Figure 26), the system will pause and the doors will unlock. Open the instrument door and ensure that sufficient reagent is present at the position in question by adding more reagent to the sample diluent trough. Make sure the door of the instrument is closed before pressing the **OK** button.



**Figure 26. Insufficient reagent on the system to complete a method.** In the event that insufficient reagent is detected in reservoir, a warning will be displayed; the instrument will pause and unlock the door. Open the door, replenish the indicated reagent, close the door and press **OK** to resume processing.

## 3.6 Hardware Crash

In the course of a method run, if the instrument experiences a physical crash of the pipetting channels into an object, an error message is displayed (Figure 27). This error message will indicate that there was a Hardware Error and the instrument has lost steps. For any situation where a physical crash of the instrument has occurred, press the **Abort** button to end the method run. Follow the instructions below for an aborted run.



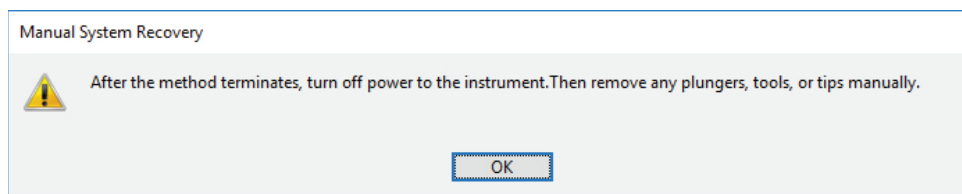
**Figure 27. Hardware Crash.** In the event that there is a physical crash of hardware components that results in an error message, press the **Abort** button on the error screen to end the method run.

## 3.7 Aborted Run



**Note:** Wait 1 minute after power cycling the Maxprep® Liquid Handler before starting the software to allow for communication to be re-established.

Once the Normalization, Sample Dilution or Sample Transfer method has started, aborting a run should be considered a last resort. However, there are situations where manually aborting a run (by pressing the **Abort** button in the lower left corner of the screen) may be necessary. Alternatively, there may be conditions where an instrument error could cause a run to be aborted. In the case of an aborted run, you will see a warning message (Figure 28) indicating that the instrument should be powered off. If the instrument has experienced a physical crash or there are plungers, tools or tips loaded on the pipetting channels, after powering the instrument off, resolve the crash state by following the instructions regarding recovering from an instrument crash found in the *Maxprep® Liquid Handler Technical Manual #TM509*. Power the instrument back on and restart the Maxprep® software. After any instrument crash, if there is not visible damage to the pipetting channels, we recommend running the Weekly Maintenance method that will check instrument calibration. If the Weekly Maintenance method produces failing results, contact Promega Technical Services to schedule a service visit prior to further use of the instrument

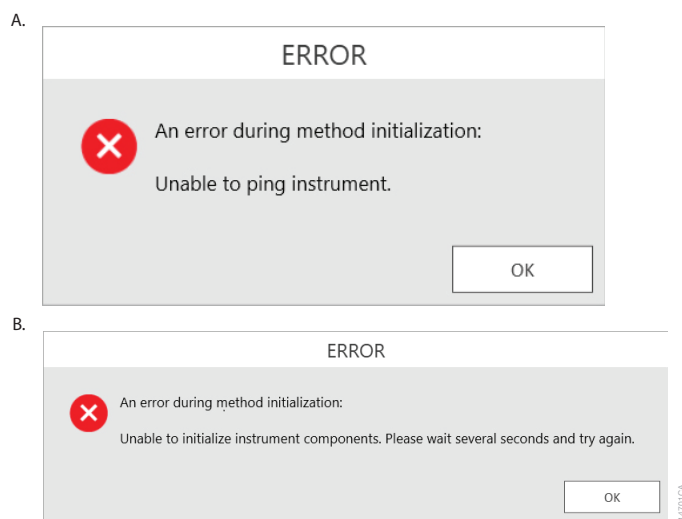


**Figure 28. Aborted Method.** A message will be displayed after aborting a run indicating that the instrument should be powered off. After turning the instrument off, open the door and manually resolve the crash state as instructed in the *Maxprep® Liquid Handler Technical Manual #TM509*. After any instrument crash, contact Promega Technical Services to determine whether the instrument may require a service visit.



## 3.8 Instrument Connection Errors

After turning the instrument on, wait at least one minute after the green light on the automated bar code scanner turns on before starting a method run. If the instrument has not performed its internal initialization before starting a run, one or more warning messages may be displayed (Figure 29). These warning messages will indicate an error in instrument connection. A message indicating “Unable to ping instrument” is displayed if the instrument is not powered on. Power the instrument on and wait at least one minute after the green light on the bar code scanner turns on before attempting to restart the method. Press the **OK** button, wait several seconds and attempt to start the method again.



**Figure 29. Instrument Connection Errors.** Connection errors will be displayed during a run if the instrument has not completed its full internal initialization before a method run is started. The errors shown in **Panels A and B** may be displayed. Confirm that the instrument is powered on and has fully initialized, then press the **OK** button, wait several seconds and attempt to start the method again.

# 4

## Variant Method Variables

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Administrators can create laboratory-specific variants of Normalization, Sample Dilution and Transfer methods. The general process of creating variant methods is discussed in the *Maxprep® Liquid Handler Technical Manual #TM509* (Section 4.3, Methods). This chapter describes the variant variables that can be adjusted by administrators for the Normalization, Sample Dilution and Sample Transfer methods. For all variables listed, the administrator can define the default value of the variable within the displayed minimum and maximum allowable values. Not all variables set within the variant methods are available for users to adjust at run time.

### 4.1 Normalization Variant Variables

The Normalization method automates the dilution of samples from a provided starting concentration to a final target concentration and volume. Variant variables allow the administrator to specify the following items: the matching behavior for sample transfer, the target concentration and volume for the final diluted samples, the minimum and maximum acceptable concentration and volume values and the maximum volume of sample that can be consumed. These variables are described in the following sections.

#### 4.1.1 Destination Tube Matching

This variable only affects the behavior of the Normalization method when tubes are used as the destination labware. When “Destination Tube Matching” is checked, the system will normalize samples into destination tubes with bar code values that exactly match that of the input sample identifiers. The system uses the first bar code entered for a sample as the sample identifier even if the sample now resides in a different labware. When tubes are selected as destination labware, samples with identifiers that do not match destination tube bar codes will not be normalized. Unchecking this variable will result in normalized samples being transferred sequentially to destination tubes when tubes are specified as the destination labware. Please apply to all Destination Tube Matching if appropriate.

#### 4.1.2 Maximum Wells to Fill

This variable defines the maximum number of wells that should be filled in a 96-well plate when plates are used as an output labware type. By default, the value of this variable is 96, indicating that all wells in a 96-well plate should be filled. Under some conditions, only a partial plate may be filled. For example, if a downstream assay like quantitative PCR uses controls and standard curves, the plate may only be filled with as many samples as could be processed in the downstream reaction. Specify the number of wells that should be filled when using a plate as an output labware type.

#### 4.1.3 Import Portal Concentration Data

This variable allows the sample identifier and sample concentration file to be imported through Portal software if connected. For assistance on how to create an assay to load sample identification and sample concentration, refer to the *Portal Access Software Technical Manual #TM549*.

#### 4.1.4 Target-Normalized Concentration

The target-normalized concentration defines the desired concentration of normalized samples. The logic applied to normalization of samples is described below. By default, the Normalization method will attempt to dilute samples such that the target concentration and volume are achieved. This value is defined without units so that the laboratory may define the unit that should be applied to the normalization (ng/ $\mu$ l,  $\mu$ g/ml, copies/ $\mu$ l, etc.). The imported sample concentrations for a run need to use the same unit definition as the concentrations specified in the variant method.

#### 4.1.5 Target-Normalized Volume ( $\mu$ l)

The target-normalized volume defines the desired volume of normalized sample to create through the normalization process. The logic applied to normalization of samples is described below. Specify the target-normalized volume in microliters.

#### 4.1.6 Maximum Volume of Sample to Consume ( $\mu$ l)

This variable defines the maximum amount of sample that can be used in the Normalization method. The Normalization method attempts to consume the least amount of sample possible to achieve the target concentration and volume specified. The Normalization method will not check that sufficient sample volume is present in the input labware. It is necessary to ensure that sufficient sample is present to satisfy the volume of sample available to consume. Specify the volume of sample available to consume in microliters.

#### 4.1.7 Minimum Normalized Concentration

The minimum normalized concentration defines the lowest acceptable concentration of normalized samples. The logic applied to normalization of samples is described below. Samples that cannot be diluted to meet the minimum or maximum normalized concentration and minimum or maximum normalized volume will not be processed. This value is defined without units so that the laboratory can define the unit that should be applied to the normalization (ng/ $\mu$ l,  $\mu$ g/ml, copies/ $\mu$ l, etc.). The imported sample concentrations for a run must use the same unit definition as the concentrations specified in the variant method.

**Note:** Concentration values less than or equal to zero will not be processed

#### 4.1.8 Minimum Normalized Volume ( $\mu$ l)

The minimum normalized volume defines the lowest acceptable volume of normalized sample to create through the normalization process. The logic applied to normalization of samples is described below. Samples that cannot be diluted to meet both the minimum normalized concentration and minimum normalized volume will not be processed. Specify the minimum allowable normalized volume in microliters.

#### 4.1.9 Maximum Normalized Concentration

The maximum normalized concentration defines the highest acceptable concentration of normalized samples. The logic applied to normalization of samples is described below. Samples that cannot be diluted to meet the minimum or maximum normalized concentration and the minimum or maximum normalized volume will not be processed. This value is defined without units so that the laboratory may define the unit that should be applied to the normalization (ng/ $\mu$ l,  $\mu$ g/ml, copies/ $\mu$ l, etc.). The imported sample concentrations for a run need to use the same unit definition as the concentrations specified in the variant method.

#### 4.1.10 Maximum Normalized Volume ( $\mu$ l)

The maximum normalized volume defines the highest acceptable volume of normalized sample to create through the normalization process. The logic applied to normalization of samples is described below. Samples that cannot be diluted to meet the minimum or maximum normalized concentration and the minimum or maximum normalized volume will not be processed. Specify the maximum normalized volume in microliters.

### 4.1.11 Normalization Method Logic

The following prioritization logic is applied to the normalization of samples:

1. Attempt to achieve the target concentration at the target volume specified in the variant.
2. If the target volume cannot be achieved, attempt to achieve the target concentration either by decreasing the normalized volume down to the minimum volume or increasing the normalized volume to the maximum volume.
3. If the target concentration cannot be achieved, even at the minimum or maximum normalized volume, attempt the minimum or maximum concentration at the minimum or maximum volume range. For low concentrations samples, attempt to maximize the concentration at the minimum normalized volume and for high concentration samples, attempt to minimize concentration at the maximum normalized volume.
4. If it is not possible to achieve the minimum or maximum normalized concentration in the minimum or maximum normalized volume, the sample will not be processed.

The setting for volume of sample available to consume will affect the decisions in the normalization logic. The lower the volume of sample available to consume, the less flexibility the method will have to meet the concentration and volume requirements in the variant.

## 4.2 Sample Dilution Variant Variables

The Sample Dilution method performs a fixed dilution of samples based on a dilution factor and dilution volume. Variant variables allow the administrator to specify the following items: the matching behavior for sample transfer, the final dilution volume, the maximum volume of sample to consume, the maximum number of wells to fill in a plate, and the dilution factor.

### 4.2.1 Destination Tube Matching

This variable only affects the behavior of the Sample Dilution method when tubes are used as the destination labware. When "Destination Tube Matching" is checked, the system will dilute samples into destination tubes with bar code values that exactly match that of the input sample identifiers. The system uses the first bar code entered for a sample as the sample identifier even if the sample now resides in a different labware. When tubes are selected as destination labware, samples with identifiers that do not match destination tube bar codes will not be diluted. Unchecking this variable will result in diluted samples being transferred sequentially to destination tubes when tubes are specified as the destination labware.

#### 4.2.2 Final Dilution Volume ( $\mu\text{l}$ )

The diluted volume defines the final volume of diluted sample to create through the dilution process. Together, the diluted volume and the dilution factor define the volume of sample that will be consumed in the dilution process. For example, a tenfold dilution factor and a 200 $\mu\text{l}$  diluted volume require that 20 $\mu\text{l}$  of sample be consumed to perform the dilution. Specify the diluted volume in microliters. The Sample Dilution method will not check that sufficient sample volume is present in the input labware. It is necessary to ensure that sufficient sample is present to satisfy the volume required for the dilution to occur. This variable is available for users to modify at run time. It is possible to narrow the range of dilution factors that a user can choose at run time by modifying the Minimum and Maximum values. To prevent users from changing the specified dilution factor at run time, uncheck the "User Modifiable" check box.

#### 4.2.3 Maximum Volume of Sample to Consume ( $\mu\text{l}$ )

This variable defines the maximum volume that may be consumed during the dilution.

#### 4.2.4 Maximum Wells to Fill

This variable defines the maximum number of wells that should be filled in a 96-well plate when plates are used as an output labware type. By default, the value of this variable is 96, indicating that all wells in a 96-well plate should be filled. Under some conditions, only a partial plate may be filled. For example, if a downstream assay like quantitative PCR uses controls and standard curves, the plate may only be filled with as many samples as could be processed in the downstream reaction. Specify the number of wells that should be filled when using a plate as an output labware type.

#### 4.2.5 Sample Dilution Factor

This variable specifies the amount that starting samples should be diluted in the destination labware. With the Sample Dilution method, samples can be diluted between 2-fold and 100-fold based on the value for the dilution factor variable. This variable is available for users to modify at run time. It is possible to narrow the range of dilution factors that a user can choose at run time by modifying the Minimum and Maximum values. The system will automatically adjust the allowable range in response to the target volume, the available sample volume and the minimum pipetting volume. To prevent users from changing the specified dilution factor at run time, uncheck the "User Modifiable" check box.

## 4.3 Sample Transfer Variant Variables

The Sample Transfer method transfers samples from the specified input labware to the specified destination labware. Variant variables allow the administrator to specify the following items: the matching behavior for sample transfer, the maximum number of wells to fill in a plate and the volume of sample to transfer.

### 4.3.1 Destination Tube Matching

This variable only affects the behavior of the Sample Transfer method when tubes are used as the destination labware. When “Destination Tube Matching” is checked, the system will transfer samples into destination tubes with bar code values that exactly match that of the input sample identifiers. The system uses the first bar code entered for a sample as the sample identifier even if the sample now resides in a different labware. When tubes are selected as destination labware, samples with identifiers that do not match destination tube bar codes will not be transferred. Unchecking this variable will result in samples being transferred sequentially to destination tubes when tubes are specified as the destination labware.

### 4.3.2 Maximum Plate Wells to Fill

This variable defines the maximum number of wells that should be filled in a 96-well plate when plates are used as an output labware type. By default, the value of this variable is 96, indicating that all wells in a 96-well plate should be filled. Under some conditions, only a partial plate may be filled. For example, if a downstream assay like quantitative PCR uses controls and standard curves, the plate may only be filled with as many samples as could be processed in the downstream reaction. Specify the number of wells that should be filled when using a plate as an output labware type.

### 4.3.3 Volume of Sample to Transfer (µl)

This variable defines the volume of sample that will be transferred from the input labware to the destination labware. The Sample Transfer method will not check that sufficient sample volume is present in the input labware. It is necessary to ensure that sufficient sample is present to satisfy the volume required for the transfer to occur. This variable is available for users to modify at run time. It is possible to narrow the range of volumes that a user can choose at run time by modifying the Minimum and Maximum values. To prevent users from changing the specified transfer volume at run time, uncheck the “User Modifiable” check box.

# 5 Troubleshooting

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For questions not addressed here, please contact your local Promega Branch, Office or Distributor. Contact information available at: [www.promega.com](http://www.promega.com). Email: [techserv@promega.com](mailto:techserv@promega.com)

| Symptoms  | Causes and Comments   |
|---|---|
| Cannot modify method run parameters   | <p>The most likely cause of this is that the administrator has disabled the ability of a user to modify this option in the variant method being run.</p> <p>If the administrator has specified that users cannot change the value of a specific variable during a run, it will not be possible to alter the value at run time.</p> <p>Check the settings specified for the variant method that is being run.</p>            |
| The desired labware type is not an available input or output labware option | <p>Many common labware types are available; however, if a specific labware used in the laboratory is not present, contact Promega Technical Services to help resolve this issue.</p>  |
| Cannot advance to the next instrument setup screen                          | <p>Confirm that all check boxes present on the screen are checked. If at a sample entry screen, confirm that the number of sample positions indicated in the input sample labware exactly matches the number of samples that was set for the run. It is not possible to proceed from a labware setup screen if there is a mismatch between the number of samples that can be processed and the sample number specified.</p> |
| Instrument error or crash during method run                                 | <p>Double-check that the labware specified during instrument setup exactly matches the labware being used for the method run. Plate movement and pipetting are dependent on precise labware definitions. Do not substitute "similar" labware for the labware specified in the method.</p>   |
| Inaccurate pipetting  | <p>Make sure that Daily and Weekly Maintenance methods are being run on a regular basis. They will check that the pipetting functions of the Maxprep® Liquid Handler are working within expected parameters.</p>  |



# 6

## Related Products

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| <b>PRODUCT</b>                                       | <b>SIZE</b>          | <b>CAT.#</b> |
|--|----------------------|--------------|
| Maxwell® RSC Plunger Pack                            | 1 each               | AS1670       |
| Maxprep® 1000µl Conductive Disposable Tips, Filtered | 40/pack (3,840 Tips) | AS9303       |
| Maxprep® 300µl Conductive Disposable Tips, Filtered  | 60/pack (5,760 Tips) | AS9302       |
| Maxprep® 50µl Conductive Disposable Tips, Filtered   | 60/pack (5,760 Tips) | AS9301       |
| Maxprep® 3-Position Reagent Tube Holder              | 1 each               | AS9409       |
| Maxprep® Plunger Holder                              | 1 each               | AS9408       |
| Maxprep® Reagent Reservoir, 50ml                     | 28/pack              | AS9304       |
| Maxprep® Waste Bags, Clear                           | 100/pack             | AS9305       |
| Maxwell® RSC/CSC Deck Tray                           | 1 each               | SP6019       |
| Maxwell® RSC/CSC 48 Front Deck Tray                  | 1 each               | AS8401       |
| Maxwell® RSC/CSC 48 Back Deck Tray                   | 1 each               | AS8402       |
| Maxwell® RSC Instrument                              | 1 each               | AS4500       |
| Maxwell® RSC 48 Instrument                           | 1 each               | AS8500       |
| Maxwell® FSC Instrument                              | 1 each               | AS4600       |
| Maxwell® CSC Instrument (RUO Mode)                   | 1 each               | AS6000       |
| Maxwell® CSC 48 Instrument                           | 1 each               | AS8000       |
| 1.1ml, Square-Well V-Bottom Deep Well Plate          | 25/pack              | V6821        |
| Nunc 2.0ml Deep Well Plates (Sterile)                | 60/pack              | AS9307       |
| 2.0ml Deep Well Plates (Non-Sterile)                 | 60/pack              | AS9309       |

# 7

## Summary of Changes

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The following changes were made to the 4/24 revision of this document:

1. Added Cat.# AS9105 and AS9205.
2. Updated font and Section 6.
3. Made general text edits and formatting changes.

It is the manufacturer's responsibility to provide equipment electromagnetic compatibility information to the customer or user.

It is the user's responsibility to ensure that a compatible electromagnetic environment for the equipment can be maintained in order that the device will perform as intended.

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